

# **MINIMUM PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR AMBULANCE PERSONNEL IN CALIFORNIA**

## **GUIDELINES**



June 2005

EMSA # 216

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FOR AMBULANCE PERSONNEL  
IN CALIFORNIA**

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**California Council of Emergency Medical Service Educators**  
**California Department of Forestry and Fire Protection**  
Office of the State Fire Marshal  
**California Environmental Protection Agency**  
**California Fire Chief's Association**  
Emergency Medical Services Section  
**California Health Executives Association of California**  
**California Highway Patrol**  
**California Occupational Safety & Health Administration**  
**California Paramedic Program Directors**  
**California Peace Officers Association**  
**California Police Chief's Association**  
**California Professional Firefighter Association**  
**California Professional Firefighter Joint Apprentice Committee**  
**California Sheriffs Association**  
**California State Firefighters Association**  
**California National Guard**  
**Citygate Associates, Llc**  
**Commission on Peace Officers Standards & Training**  
**County Health Executives Association of California**  
**Department of Health Services**  
Division of Drinking Water & Environmental Management  
Emergency Preparedness Office  
Radiological Health Branch  
**Department of Mental Health**  
**Emergency Medical Directors Association of California, Inc.**  
**Emergency Medical Services Authority**  
Disaster Interest Group, Hospital & Health Systems  
Disaster Medical Services Division  
Medical Consultants  
**Emergency Medical Services Administrators Association of California**  
**Los Angeles City Fire Department**  
**Los Angeles County Department of Health Services**  
Emergency Medical Services Agency  
**Metropolitan Medical Response System**  
Anaheim  
Fremont  
Los Angeles  
San Diego  
San Francisco  
**Office of Emergency Services**  
Fire & Rescue Branch  
Law Enforcement Branch  
California Specialized Training Institute  
**Service Employees International Union**

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**TABLE of CONTENTS**

I.	EMS Safety & WMD Training Committee .....	1
A.	Prepared by .....	1
B.	EMS Safety & WMD Training Committee Representatives .....	2
II.	Table of Contents .....	3
III.	Issue: Personal Protective Equipment for Ambulance Personnel .....	4
A.	Introduction .....	4
B.	Background .....	4
C.	Discussion .....	5
D.	Committee Goals & Recommendations .....	6
IV.	Guidelines .....	7
V.	Appendix A: Identifying Required Personal Protection (PPE Level A through D) .....	11

# **MINIMUM PERSONAL PROTECTIVE EQUIPMENT (PPE) FOR AMBULANCE PERSONNEL IN CALIFORNIA**

## **Introduction**

At the suggestion of the Emergency Medical Services (EMS) Commission, the EMS Authority (EMSA) formed a committee to develop guidelines to enhance the safety and training of EMS responders. Membership consists of public and private constituent groups and experts. The first meeting convened in April 2004. The first priority of the group was to develop Guidelines for standardizing personal protective equipment (PPE) for EMS personnel.

These Guidelines can be implemented by local EMS agencies, with cooperation from EMS service providers. Funding for most of the items within the Guidelines is available through the Department of Homeland Security.

## **Background**

The working environment for all first responders changed following the terrorist events of “September 11th”. At the World Trade Center, 450 emergency responders perished. This was one-sixth of the total number of victims. These basic potential differences between terrorist incidents and natural disasters include the scale, duration, and complexity regarding the potential range of hazards that could be present. Additionally, incidents at the World Trade Center and Pentagon demonstrated shortfalls in first responder preparedness:

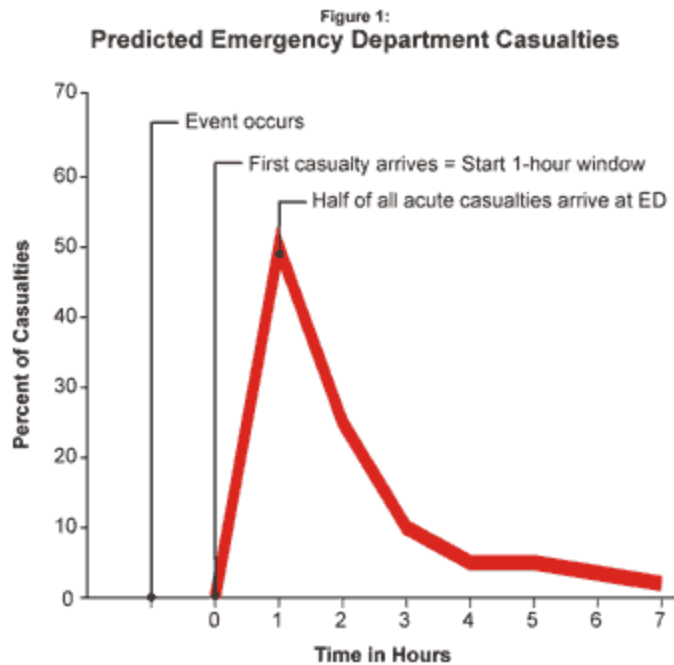
- Unavailability of PPE, particularly at the beginning of an incident,
- Lack of interoperability, i.e., many types or brands of equipment, and many vendors,
- Inadequate prescription, fit, use, and maintenance of various PPE, and
- Lack of participation in training and exercises for multi-casualty events.

First responders, including medical personnel need a greater level of protection including proper equipment and training to enable an “all-hazard” response with an emphasis on chemical, biological, radiological, nuclear, and explosive (CBRNE) events. EMSA considered the adequacy of personal protective equipment (PPE) and related training for EMS and ambulance personnel and found it lacking. A subsequent EMSA survey of EMS Directors from other states failed to produce any statewide recommendations for PPE for EMS personnel.

## Discussion

Since September 11, 2001, increasing demands to prepare for and respond to disasters have been placed upon the ambulance workforce. The U.S. Department of Homeland Security has made funding available to enhance response to terrorist attacks.

Public and private EMS personnel form the backbone of the emergency medical response to disasters within the first eight hours following an event. Using data from the U.S. Centers for Disease Control, the transport and treatment of patients are largely within a short time period (see Figure 1). While predicting emergency department casualties, this identifies the critical need to have local and regional medical resources available within the first few hours as a base capability. As a result, an emphasis has been placed upon enhancing the prehospital “surge capacity” as well as the hospital “surge” capacity.



The EMSA identified a problem with widely varying levels of PPE and individual preparedness for EMS and ambulance personnel in California. Personal protective equipment is clothing and gear designed to protect workers from safety and health hazards, as well as to prevent injury resulting from incorrect use or malfunction of equipment. In general, the greater risk, the greater the level of PPE required.

## Committee Goals & Recommendations

The EMSA convened a Committee to examine this issue, comprised of leaders from the California Fire Chief's Association, California Ambulance Association, EMS Administrator's Association, various union and professional organizational representatives, and others. The Committee agreed that it is in the best interest of the State and its EMS personnel to have minimal, proper PPE available routinely to EMS responders. They identified the following goals as important considerations in the development of these Guidelines:

- Increase safety for EMS personnel
- Develop uniform, statewide guidance on PPE for EMS personnel, to include both the public and private sectors
- Meet or exceed State and federal standards
- Reduce purchasing and training costs
- Promote funding opportunities
- Increase mutual aid interoperability

Through consensus, the Committee developed the list of recommended minimum PPE. The recommendations are in addition to applicable OSHA and Cal-OSHA standards, and are derived largely from the following published standards:

- 1) NFPA 1999 EMS Standards (2003 ED)
- 2) OSHA: OSHA's General Description & Discussion of the Levels of Protection and Protective Gear – 29 CFR 1926.65 App. B, Part IV, Level D

The minimum PPE for respiratory protection is Level D, with an escape hood immediately available. In some work environments, based upon the specific job duties, all EMS personnel have a full complement of Level C protection available to protect them from specific hazards that they may encounter. This will be determined by the employing agency. Respiratory protection equipment requires employers to have a respiratory program. (See Appendix A for graphics and brief descriptions of the Level A through Level D.)

The Guidelines are for both public and private EMS providers, as well as for “non-emergency” providers of ambulance services. Ambulance services in California may have both emergency and non-emergency roles on a daily basis. In some jurisdictions, ambulance services may be primarily utilized in a “non-emergency” capacity. EMSA believes that these “non-emergency” providers may represent an immediate source of prehospital “surge” capacity within a system. These EMS providers should be fully integrated into any response plan, and have the same PPE immediately available as other providers.

These Guidelines also promote the need for California's EMS personnel to have suitable, standardized PPE on a day-to-day basis, as well as for potential extended operations or terrorist incidents. EMS providers should ensure that personnel receive proper training in all available equipment.

**GUIDELINES  
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- Every person working on an ambulance in California (public or private, emergency or non-emergency) should have available the following *minimum* equipment, supplies, and personal protective equipment (PPE) – per responder – to ensure safety, readiness, and the ability to meet surge capacity.
- Use of respiratory equipment must be covered by fitting, fit-testing, training, proficiency, and core competencies, for each responder prior to provision, and periodically thereafter.
- Ambulance personnel should not respond to an incident requiring PPE beyond their level of provision and training, without adhering to published standards.
- Funding for the majority of these items – for both public and private entities – is available through the Office of Homeland Security (OHS) Grant Program.

ITEM	Worn	Unit	HQ	<b>SPECIFICATIONS</b> <ul style="list-style-type: none"><li>• <i>NFPA 1999 EMS Standards (2003 ED)</i><sup>i</sup></li><li>• <i>OSHA 29 CFR 1926.65 App. B, Part IV, Level D</i><sup>ii</sup></li><li>• <i>Cal OSHA</i> where federal OSHA 29, and other standards as applicable, are exceeded</li><li>• <i>Firescope California Standardized Hazardous Materials Equipment List</i><sup>iii</sup></li></ul>
Head				
Hard Hat - Work Helmet <ul style="list-style-type: none"><li>• Blue</li></ul>		1		NFPA 1951 ANSI Z89.1-1986 (Class and B), OSHA: 29 CFR 1910.135 & 29 CFR 1926.100(b), CSA Z94.1-M1992 (Class G), or equivalent
Eye Protection	1			NFPA 1999 ANSI Z87.1 e.g., glasses, face shield, or work goggles, or mask with side protection and splash resistance for infection control. Fit over glasses and sunglasses - preferred
Hearing Protection	1 pair			Ear plugs or other
Body				
Garment – EMS (Uniform) <ul style="list-style-type: none"><li>• Blue preferred</li></ul>	1 set			Multiple use NFPA 1999 EMS Standards Full-body - shirt & pants, or jumpsuit/coveralls Barrier protection
Garment – single use		1 set		NFPA 1999 e.g., barrier garment, such as “white Tyvek”
Hooded, chemical-resistant clothing			1 set	Decontamination equipment and material used to clean, remediate, remove, or mitigate chemical, biological, or radiological contamination. OSHA: disposable chemical resistant overalls, or 2-piece chemical-splash suit
Jacket, full length – EMS, with reflective stripes		1		NFPA 1999 EMS Standards, <i>if</i> full body coverage top is not worn underneath.



ITEM	Worn	Unit	HQ	SPECIFICATIONS
				<ul style="list-style-type: none"> <li>• <u>NFPA 1999 EMS Standards (2003 ED)</u><sup>i</sup></li> <li>• <u>OSHA 29 CFR 1926.65 App. B, Part IV, Level D</u><sup>ii</sup></li> <li>• <u>Cal OSHA</u> where federal OSHA 29, and other standards as applicable, are exceeded</li> <li>• <u>Firescope California Standardized Hazardous Materials Equipment List</u><sup>iii</sup></li> </ul>
<b>Hands</b>				
Gloves – Chemical-protective, nitrile		1 box		Single use. Body substance isolation. Nitrile-type or equivalent. Latex may be used for exams. 21 CFR 880, Class 2 EN 455-2 sizing
Gloves – Work		1 pair		Multiple use NFPA 1999: <ul style="list-style-type: none"> <li>• Physical protection (cut resistance: leather or other)</li> <li>• Barrier protection</li> </ul>
<b>Feet</b>				
Footwear	1 pair			Multi-use, Safety NFPA 1999 EMS Standards: <ul style="list-style-type: none"> <li>• Height: min. 4"</li> <li>• Cut, puncture, &amp; abrasion resistant</li> <li>• Toe safety</li> <li>• Barrier protection</li> <li>• ANSI Z41-1991 - American National Standard for Personal - Protective Footwear, if determined by entry job description, or incident response zone</li> </ul> OSHA: <ul style="list-style-type: none"> <li>• Safety toe &amp; shank</li> <li>• Chemical resistant</li> </ul>
Footwear covers		1 pair		Single-use NFPA 1999 OSHA: chemical resistant
<b>Respiratory</b> <sup>iv</sup>				
<ul style="list-style-type: none"> <li>• N-100 Mask, <u>or</u></li> <li>• N-95 Mask</li> </ul>		5		Including applicable: <ul style="list-style-type: none"> <li>• Written Respirator Program policies</li> <li>• Health questionnaire</li> <li>• Fit-testing</li> <li>• Training: selection, use, storage</li> </ul> Specifications: <ul style="list-style-type: none"> <li>• NIOSH Respirator Selection Logic 2004, <a href="http://www.cdc.gov/niosh/docs/2005-100/default.html">http://www.cdc.gov/niosh/docs/2005-100/default.html</a></li> <li>• <u>OSHA 42 CFR 84</u> - Breathing Apparatus Standards a</li> <li>• <u>8CCR 5144</u> - Respiratory protection regulation governing the use of all respirators, including that for TB</li> <li>• <u>Firescope California Standardized Hazardous Materials Equipment List</u>, 2004 Ed, pg. 7-10</li> </ul>
Escape Hood <sup>v</sup>	1			As previous, above Note: Follow NIOSH standards, when finalized

ITEM	Worn	Unit	HQ	SPECIFICATIONS
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<b>Routine Equipment</b>				
Flashlight, small	1			Or headlamp
Knife - Folding	1			Capable of cutting seatbelts
Glass punch	1			Capable of breaking windshields
Scissors/Shear	1			Bandage/Utility Note: Small equipment items/tools can be combined in a “multi-tool”
Stethoscope	1			
Personal communication device	1			Radio, on appropriate frequency
<ul style="list-style-type: none"> <li>• Field Operations Guides (FOGs)</li> </ul>		Yes		Per local entity policy
Prophylactic Medications: <ul style="list-style-type: none"> <li>• Mark I Auto-Injector Kit</li> </ul>		1		<ul style="list-style-type: none"> <li>• As determined by local hazard assessments</li> <li>• Written policies &amp; procedures re: administration and rotation.</li> <li>• Located on designated units/rigs</li> </ul>
<b>Extended Operations Equipment</b>				
Daypack—“Go Pack”, containing:			1	Mission-ready backpack or duffel bag for response operations during a potential extended, or weapon(s) of mass destruction, event. <ul style="list-style-type: none"> <li>• Equipped for individual’s self-sustainment for 72 hours</li> <li>• Containing supplies, equipment, and references needed to sustain operations and provide general response operations support</li> </ul>
<ul style="list-style-type: none"> <li>• Water</li> </ul>			1 qt.	
<ul style="list-style-type: none"> <li>• Water purification</li> </ul>			1	Tablets or device
<ul style="list-style-type: none"> <li>• Rain Gear</li> </ul>			1 set	<ul style="list-style-type: none"> <li>• Head protection</li> <li>• Top protection</li> <li>• Bottom – optional</li> </ul>
<ul style="list-style-type: none"> <li>• Extra set of emergency medical garments</li> </ul>			1 set	Emergency medical garment, as above
<ul style="list-style-type: none"> <li>• MRE</li> </ul>			For 72 hrs.	Meals Ready-to-Eat, or equivalent
<ul style="list-style-type: none"> <li>• Ear protection</li> </ul>			1 set	Extra set

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Prophylactic medications:			1	
<ul style="list-style-type: none"> <li>• Mark I Antidote Kit</li> </ul>				
<ul style="list-style-type: none"> <li>• Field Operations Guides (FOGs)</li> </ul>		Yes		Per local entity policy

Funding: Office of Homeland Security (OHS) Grant Program. For 2005, see "[Responder Knowledge Base, FY2005 Authorized Equipment List](http://www2.rkb.mipt.org/ael_fy2005.cfm)" (for grant funding) [http://www2.rkb.mipt.org/ael\\_fy2005.cfm](http://www2.rkb.mipt.org/ael_fy2005.cfm)

<sup>i</sup> NFPA 1999 EMS Standards (2003 ED). Reference: [NFPA 1999 EMS Standards \(2003 ED\)](http://webstore.ansi.org/ansidocstore/product.asp?sku=199903PDF) – downloadable, \$28.75. <http://webstore.ansi.org/ansidocstore/product.asp?sku=199903PDF>

<sup>ii</sup> OSHA's General Description & Discussion of the Levels of Protection and Protective Gear – 29 CFR 1926.65 App. B, Part IV, Level D. <http://www.osha-safety-training.net/PUB/pubs.html>

<sup>iii</sup> *Firescope California Standardized Hazardous Materials Equipment List, Ed. 2004*, Personal Protective Equipment (PPE). <http://www.firescope.org/ics-hazmat/pos-manuals/haz-equipulst.pdf>

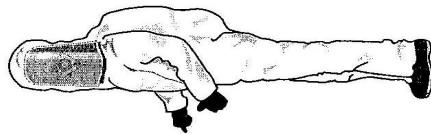
<sup>iv</sup> Respiratory Notes:

- Escape hoods, and Masks (N-95, N-100, and P-100) are *not safe* for engineered-aerosol dispersion or weaponized substances.
- All N-95, N-100, P-100 rated equipment – whether disposable masks, APR, or PAPR respirators – are valid for use against particulate contaminants only, *not* vapors or gases.
- N-100 & P-100, strictly speaking, filter to 99.97% efficiency for particles 0.3 microns in diameter.
- The nine classes of particulate respirators (N, P, R, 95, 99, and 100) are available as filtering face piece (disposable) respirators, but are also available with elastomeric face pieces and disposable filters and/or cartridges.
- In a potential bio-terrorism event, a paper mask will not be sufficient, since an agent could potentially enter through the eyes. Although NIOSH currently gives half face piece, elastomeric respirators the same protection factor as disposable ones by NIOSH, it is a controversial determination.
- A full face-piece, elastomeric respirator not only protects the eyes; it is given a higher assigned protection factor than half-face respirators.
- Where Cal/OSHA has jurisdiction, Section 5192 (HAZWOPER) applies to employees *going to* the site of a *release*. In such an event, minimum respirator requirements in for those in the assigned section would apply, namely, self-contained breathing apparatus (SCBA) *until* reduced by the Incident Commander.
- *Firescope California Standardized Hazardous Materials Equipment List, Ed. 2004*, Personal Protective Equipment (PPE), pg. 7-12, et seq.

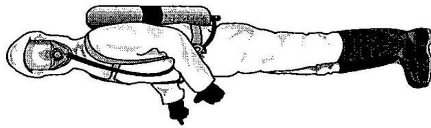
<sup>v</sup> OSHA Safety & Health Information Bulletin: "[CBRN Escape Respirators](http://www.osha.gov/dts/shib/shib082903a.html)", provides guidance on use, selection, and training. OSHA's *Current Policy and Interim Guidance for Respirator Program Managers*: <http://www.osha.gov/dts/shib/shib082903a.html>



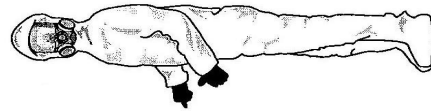
LEVEL A



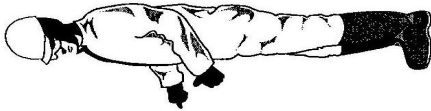
LEVEL B



LEVEL C



LEVEL D



Personal protective equipment (PPE) is designed to protect workers from safety and health hazards and prevent injury resulting from incorrect use and/or malfunction of equipment. In general, the greater the level of risk, the greater the level of PPE required. PPE includes:

- Respirators: SCBA, air-purifying respirator
- Full body covering including nitrile, butyl rubber, or Viton gloves and boots
- Safety glasses or goggles
- Hard hat
- Cold weather gear, including steel-toed footwear or arctic boots
- Hearing protection

PPE is divided into four categories based on the level of personal protection afforded.

- Level A provides the greatest level of skin, respiratory and eye protection.
- Level B offers the highest level of respiratory protection but lesser level of skin protection (e.g., skin protection is required for exposure to liquids but not vapor).
- Level C is used when concentrations and types of airborne substances are known and the criteria for using air-purifying respirators are met.
- Level D consists of work clothing affording minimal protection, used for nuisance contamination only.

Most spill-site workers will use Levels C and D.



## EQUIPMENT

## LEVEL A

- SCBA, or positive-pressure supplied-air respirator with escape SCBA
- Totally encapsulating chemical-protective suit with vapor barrier
- Coveralls\*
- Long underwear\*
- Gloves, outer, chemical resistant
- Gloves, inner, chemical resistant
- Boots, chemical resistant, steel toe and shank
- Hard hat (under suit)\*
- Disposable protective suit, gloves and boots (may be worn over or under encapsulating suit depending on suit design)

## LEVEL B

- SCBA, or positive-pressure supplied-air respirator with escape SCBA
- Hooded chemical-resistant clothing (coveralls and long-sleeved jacket coveralls; one- or two-piece chemical splash suit; disposable chemical-resistant coveralls). May also be encapsulating.
- Coveralls\*
- Gloves, outer, chemical resistant
- Gloves, inner, chemical resistant
- Boots, chemical resistant, steel toe and shank
- Boot covers, outer, chemical resistant, disposable\*
- Hard hat\*
- Face shield\*

## LEVEL C

- Full-face or half-mask air-purifying respirators with appropriate cartridges
- Hooded chemical-resistant clothing (coveralls; two-piece chemical-splash suit; disposable chemical-resistant coveralls.)
- Coveralls\*
- Gloves, outer, chemical resistant
- Gloves, inner, chemical resistant
- Boots, chemical resistant, steel toe and shank
- Boot covers, outer, chemical resistant, disposable\*
- Hard hat\*
- Escape mask\*
- Face shield\*

## LEVEL D

- Coveralls
- Gloves\*
- Boots/shoes, chemical resistant, steel toe and shank
- Boots, outer, chemical resistant, disposable\*
- Safety glasses or chemical splash goggles
- Hard hat
- Escape mask\*
- Face shield\*

\* Optional